

the water had been filtered. From these experiments it seems clear that the abundance of fish and invertebrates in shallow bays does not necessarily imply that salinity, temperature, or food are the factors that attract them. On the other hand, it is clear that these factors will be very important in determining growth and survival.

From the above experiments we can only say that the animals apparently prefer bay water. We do not know how they reach that habitat. It might be that the organic compounds act only as a stimulus and that there are other factors such as currents which help in guiding or transporting animals toward the mainland bays.

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Equalant II, a Mid-Summer "Photograph" of the Oceanographic Conditions, Tropical Atlantic Ocean

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Abstract

Scientists aboard 12 vessels from 8 nations participated in EQUALANT II, a quasi-synoptic oceanographic study of the waters of the tropical Atlantic. A similar, multiple vessel survey (EQUALANT I) was completed during February-March, 1963. These two surveys, designated as the International Cooperative Investigations of the Tropical Atlantic (ICITA), were coordinated by UNESCO's Intergovernmental Oceanographic Commission. The program of observations and samples, common to each vessel, included temperature, salinity, oxygen, and inorganic phosphate (surface to bottom), daily measurements of primary productivity, zooplankton tows, and routine bathythermograph, meteorological and sea surface radiation observations.

The two 15-day, multiple vessel surveys, EQUALANTS I and II, were planned so that the resulting data could be used to develop a "photograph" of the major winter and summer, surface and subsurface circulation features and the associated distribution of properties, of the rates of primary productivity in the surface waters (to the depth of the one percent fraction of incident radiation) and of the volumes and composition of the zooplankton (surface to top of the thermocline).

The ICITA data and atlases, both to be prepared for publication by the National Oceanographic Data Center, will be used during the planning and scheduling of future, more detailed, oceanographic, marine biological, and fishery investigations in the waters of the tropical Atlantic ocean.

Fishing Methods Developed for Small Boats

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SMALL BOATS play a most important part in many fisheries of the world. Although some of the methods used for the capture of fish from small boats may be considered primitive, many fishermen may find some interest in what is done in other parts of the world.

Line Fishing

First let us deal with line fishing as this must be one of the most important fishing methods of the small boat fishermen.

Today there is a choice of hemp, cotton, nylon, Dacron, and wire.

After our experiments, nylon monofilament lines of several breaking strengths have been widely accepted over the old hemp line by the entire local fishing fleet. As a trolling line the nylon can be much finer, is less visible in the water, and as a result more fish are landed. It is estimated that our dolphin (*Coryphaena*) fishery has been increased 33½% since the introduction of nylon lines. Wire line has played an important part in the capture of wahoo. Again it is suspected that the fine wire is the reason for the successes over the hemp line, and the wire line sinks deeper than the nylon. Wire lines are quite easily handled, either with gloves, or on a rod, but commercial fishermen prefer hand lines.

It has been found that one person can handle a 40-50 pound wahoo on a wire line, provided the line is hauled while it rests on the gunwale of the vessel. When the wire is lifted off the gunwale the fish is likely to fight or call for line which can be very awkward. Small boats manned by one or two men often fish three lines from a boat with an 8- to 8½-foot beam. The center line is a wire line, with two nylon lines on the beams, or it may be one nylon line in the center with two wire lines on the beams. This method avoids entangling the lines when turning the vessel. Outriggers and weights of different sizes may be used with advantage.

With crews of one or two persons fishing from a boat, the lines are attached to a rubber harness and the line is not disturbed by the crew until the rubber harness is good and properly stretched. The rubber being more sensitive than a person's reflexes does not permit a slipping line, especially unlucky if a wahoo has struck, as the hook must be set before the fish is allowed any run.

Lines are also used in a number of ways for the capture of fish which swim at depths, and recently we have introduced to the industry a miniature long line of just five hooks for use from a small boat. This method of fishing takes place from a drifting boat, during a flying fish operation. A heavy nylon line